LED level meter driver, 5-point, VU scale

BA6144

The BA6144 is a driver IC for LED VU level meters in stereo equipment and other display applications.
The IC displays the input level (range : −13dB to +17dB) on a 5-point, bar-type LED display.The BA6144 includes a rectifier amplifier allowing direct AC input, and has constant-current outputs, so it can directly drive the LEDs without variations in LED current due to supply voltage fluctuations.

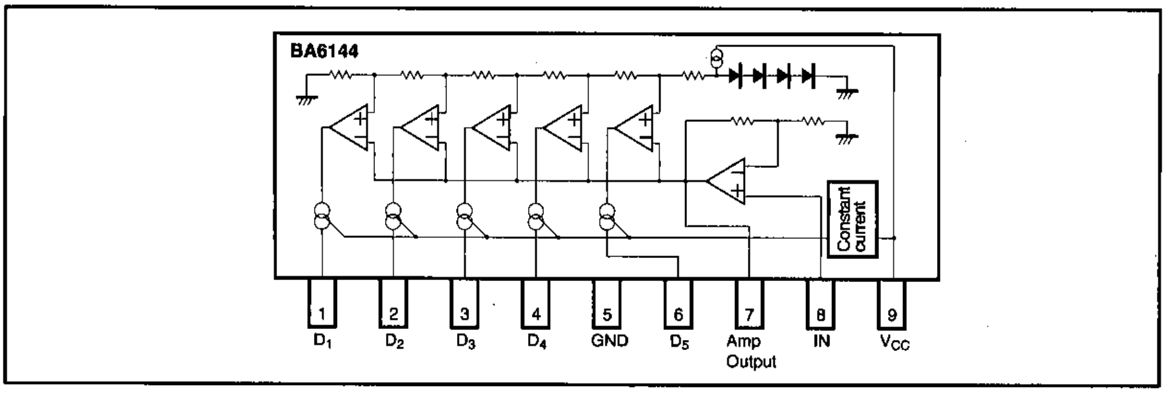
●Applications

VU meters, signal meters, and other display devices.

●Features

1) Rectifier amplifier allows either AC or DC input.
2) Wide display level range (−13 to +17), so signals with large dynamic range can be displayed.
3) Current output is optimized for red LEDs, for low power consumption.
4) Built-in reference voltage means that power supply voltage fluctuations do not effect the display.
5) Wide operating voltage range (5.5V to 16V) for a wide range of applications.
6) Low PCB space requirements. Comes in a compact 9-pin SIP package and requires few external components.

●Block diagram



●Absolute maximum ratings (Ta = 25℃)

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	18	V
Power dissipation	Pd	800*	mW
Operating temperature	Topr	−25~70	℃
Storage temperature	Tstg	−55~125	℃
Junction temperature	Tj	150	℃

* Reduced by 6.4mW for each increase in Ta of 1°C over 25°C.

●Electrical characteristics (unless otherwise specified Ta = 25℃, V_{CC} = 12V, and f = 1kHz)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
Operating voltage range	V_{CC}	5.5	12	16	V	—	Fig.1
Quiescent current	I_Q	—	7	12	mA	V_{IN}=0V	Fig.1
Control level 1	V_{C1}	−16	−13	−9	dB	—	Fig.1
Control level 2	V_{C2}	−9	−7	−4	dB	—	Fig.1
Control level 3	V_{C3}	—	0	—	dB	Adjustment point	Fig.1
Control level 4	V_{C4}	7	10	12	dB	—	Fig.1
Control level 5	V_{C5}	13	17	19	dB	—	Fig.1
Sensitivity	V_{IN}	21	47	62	mV_{rms}	V_{C3} on level	Fig.1
LED current	I_{LED}	11	15	18.5	mA	—	Fig.1
Input bias current	I_{INO}	—	0.3	1.0	μA	—	Fig.1

●Measurement circuit

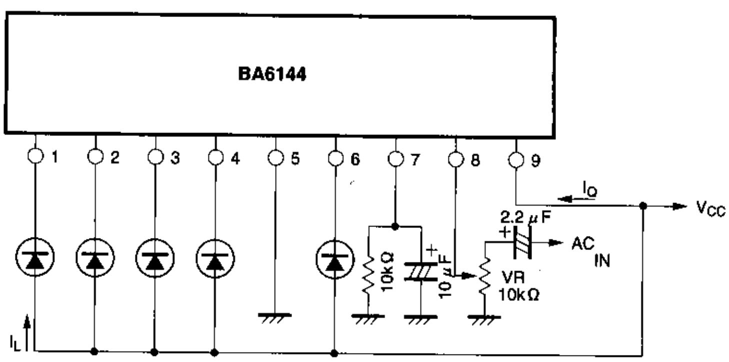


Fig. 1

●Application example

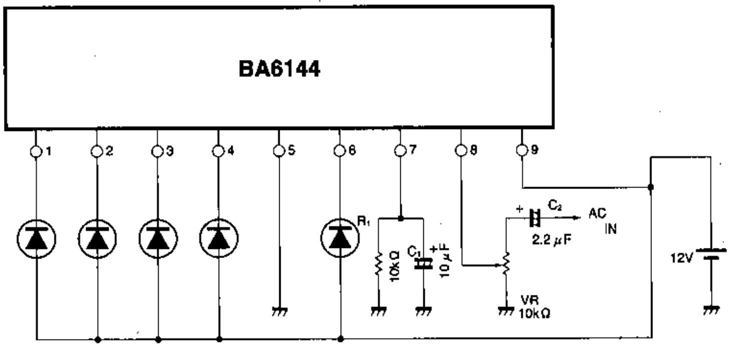


Fig. 2

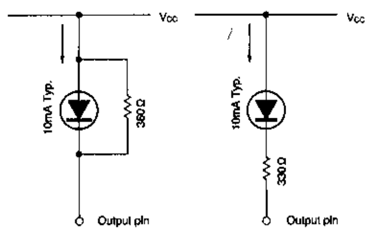


Fig. 3

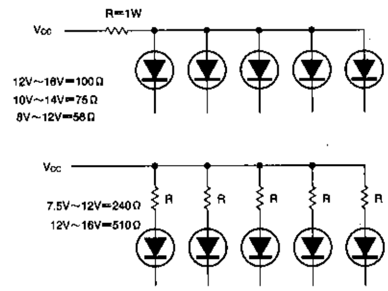


Fig. 4

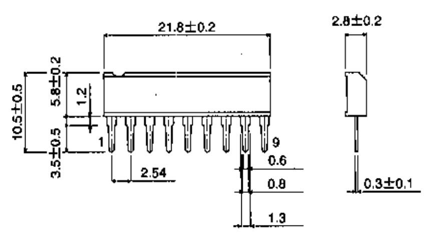
The response time (attack and release time) can be changed by varying the values of C_1 and R_1 to change the time constant.

C_2 is a coupling capacitor, and the potentiometer VR varies the input level. Input a fixed voltage level and adjust the potentiometer so that the LED lights at 0dB.

To reduce the LED current, connect a resistor either in parallel (Fig. 3 (1)) or in series (Fig. 3 (2)) with the LED. If a resister is connected in series with the LED, the LED current will change if the supply voltage fluctuates.

Note: If the power supply voltage exceeds 9V, insert a resistor in series with the LED current supply line, or connect a heat sink so that the maximum power dissipation Pd Max. is not exceeded (see Fig. 4).

●External dimensions (Unit: mm)



SIP9